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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--------------------------------|-------------|----------------------|---------------------|------------------|
| 10/717,731 | 11/20/2003 | Shih-Fang Chuang | TI-36243 | 8713 |
| 23494 | 7590 | 06/18/2007 | EXAMINER | |
| TEXAS INSTRUMENTS INCORPORATED | | | PHAM, HOAI V | |
| P O BOX 655474, M/S 3999 | | | ART UNIT | PAPER NUMBER |
| DALLAS, TX 75265 | | | 2814 | |
| NOTIFICATION DATE | | DELIVERY MODE | | |
| 06/18/2007 | | ELECTRONIC | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

uspto@ti.com
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| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/717,731 | CHUANG, SHIH-FANG | |
| | Examiner | Art Unit | |
| | Hoai v. Pham | 2814 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 5/16/2007.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 17-21 and 25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 17-21 and 25 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 20 November 2003 is/are: a) accepted or b) objected to by the Examiner. Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a). Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____. | 6) <input type="checkbox"/> Other: _____. |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 17-21 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akram et al. [U.S. Pat. 5,866,953] previously applied, in view of Papathomas [U.S. 2002/0105093] previously applied.**

With respect to claim 18, Akram et al. (fig. 6, cols. 4-6) discloses a semiconductor device comprising:

a semiconductor die (602) having a bottom surface (604);

a chip carrier (608);

a die attach material (not numbered); and

the semiconductor die (602) attached to the chip carrier (608) with the die attach material, wherein the die attach material covers the entire bottom surface of the semiconductor die.

Akram et al. do not disclose the die attach material including a component of a tungstate material. However, Papathomas (col. 7, pp [0043]) discloses that tungstate material is well known material in the art for using as the die attach material (14). Therefore, it would have been obvious to one having skill in the art at the time the

invention was made to select tungstate material as known material, as taught by Papathomas, into the device of Akram et al. in order to improve the thermal heat transfer from the chip to the surroundings. Moreover, selection of a known material based on its suitability for its intended use supported a *prima facie* obviousness determination in *Sinclair & Carroll Co., Inc. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

With respect to claim 17, Akram et al. (fig. 6 and col. 5, lines 35-36) discloses that the chip carrier (608) is selected from a group consisting of a substrate and a leadframe.

With respect to claim 19, Akram et al. (fig. 6; col. 4, lines 1-6 and col. 5, lines 44-47) discloses that an encapsulant (626, 630) encapsulates the semiconductor die, the encapsulant (424, 428) including a component of negative CTE.

With respect to claim 20, as reason given above, Papathomas (fig. 1 and col. 7, pp [0043]) discloses that the encapsulant (14) includes a tungstate material.

With respect to claim 21, Akram et al. (fig. 6; col. 4, lines 1-6 and col. 5, lines 44-47) discloses that the encapsulant (626, 630) is selected from a group consisting of a mold compound and a glob-top material.

With respect to claim 25, as reason given above, Papathomas (fig. 1 and col. 7, pp [0043]) discloses that the die attach material (14) and the encapsulant (14) include zirconium tungstate.

Response to Arguments

3. Applicant's arguments with respect to claims 17-21 and 25 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoai v. Pham whose telephone number is 571-272-1715. The examiner can normally be reached on M-F.

5. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M. Fahmy can be reached on 571-272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

6. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



HOAI PHAM
PRIMARY EXAMINER